



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

CPH5902

TR : NPN Epitaxial Planar Silicon Transistor

FET : N-Channel Silicon Junction FET

High-Frequency Amplifier. AM Amplifier. Low-Frequency Amplifier Applications

Features

- Composite type with J-FET and NPN transistors contained in the CPH5 package, improving the mounting efficiency greatly
- The CPH5902 contains a 2SK2394-equivalent chip and a 2SC4639-equivalent chip in one package
- Drain and emitter are shared

Specifications

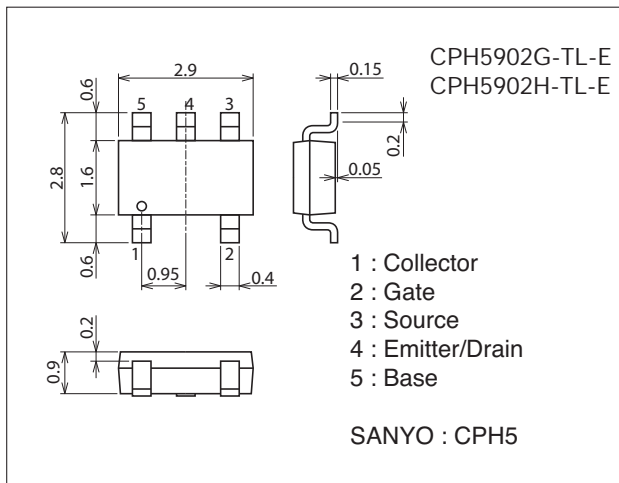
Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|--------|--|-------------|------|
| [FET] | | | | |
| Drain-to-Source Voltage | VDSX | | 15 | V |
| Gate-to-Drain Voltage | VGDS | | -15 | V |
| Gate Current | IG | | 10 | mA |
| Drain Current | ID | | 50 | mA |
| Allowable Power Dissipation | PD | Mounted on a ceramic board (600mm ² ×0.8mm) | 350 | mW |
| [TR] | | | | |
| Collector-to-Base Voltage | VCBO | | 55 | V |
| Collector-to-Emitter Voltage | VCEO | | 50 | V |
| Emitter-to-Base Voltage | VEBO | | 6 | V |
| Collector Current | IC | | 150 | mA |
| Collector Current (Pulse) | ICP | | 300 | mA |
| Base Current | IB | | 30 | mA |
| Collector Dissipation | PC | Mounted on a ceramic board (600mm ² ×0.8mm) | 350 | mW |
| [TR] | | | | |
| Total Power Dissipation | PT | Mounted on a ceramic board (600mm ² ×0.8mm) | 500 | mW |
| Junction Temperature | Tj | | 150 | °C |
| Storage Temperature | Tstg | | -55 to +150 | °C |

Package Dimensions

unit : mm (typ)

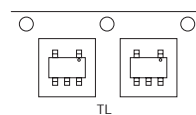
7017A-007



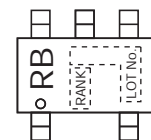
Product & Package Information

- Package : CPH5
- JEITA, JEDEC : SC-74A, SOT-25
- Minimum Packing Quantity : 3,000 pcs./reel

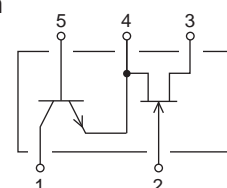
Packing Type : TL



Marking



Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

CPH5902

Electrical Characteristics at Ta=25°C

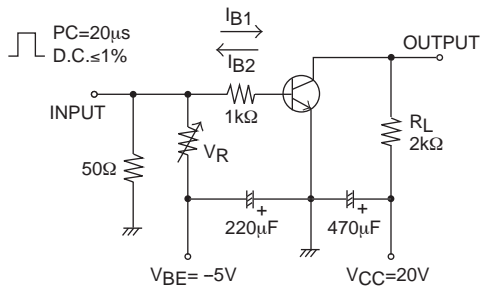
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---------------|--|---------|------|-------|---------|
| | | | min | typ | max | |
| [FET] | | | | | | |
| Gate-to-Drain Breakdown Voltage | $V_{(BR)GDS}$ | $I_G = -10\mu A, V_{GS} = 0V$ | -15 | | | V |
| Gate Cutoff Current | I_{GSS} | $V_{GS} = -10V, V_{DS} = 0V$ | | | -1.0 | nA |
| Cutoff Voltage | $V_{GS(off)}$ | $V_{DS} = 5V, I_D = 100\mu A$ | -0.4 | -0.7 | -1.5 | V |
| Drain Current | I_{DSS} | $V_{DS} = 5V, V_{GS} = 0V$ | 10.0* | | 32.0* | mA |
| Forward Transfer Admittance | $ y_{fs} $ | $V_{DS} = 5V, V_{GS} = 0V, f = 1kHz$ | 24 | 38 | | mS |
| Input Capacitance | C_{iss} | $V_{DS} = 5V, V_{GS} = 0V, f = 1kHz$ | | 10.0 | | pF |
| Reverse Transfer Capacitance | C_{rss} | $V_{DS} = 5V, V_{GS} = 0V, f = 1kHz$ | | 2.9 | | pF |
| Noise Figure | NF | $V_{DS} = 5V, R_g = 1k\Omega, I_D = 1mA, f = 1kHz$ | | 1.0 | | dB |
| [TR] | | | | | | |
| Collector Cutoff Current | I_{CBO} | $V_{CB} = 35V, I_E = 0A$ | | | 0.1 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 4V, I_C = 0A$ | | | 0.1 | μA |
| DC Current Gain | h_{FE} | $V_{CE} = 6V, I_C = 1mA$ | 135 | | 400 | |
| Gain-Bandwidth Product | f_T | $V_{CE} = 6V, I_C = 10mA$ | | 200 | | MHz |
| Output Capacitance | C_{ob} | $V_{CB} = 6V, f = 1MHz$ | | 1.7 | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 50mA, I_B = 5mA$ | | 0.08 | 0.4 | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = 50mA, I_B = 5mA$ | | 0.8 | 1.0 | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = 10\mu A, I_E = 0A$ | 55 | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 1mA, R_{BE} = \infty$ | 50 | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = 10\mu A, I_C = 0A$ | 6 | | | V |
| Turn-On Time | t_{on} | See specified Test Circuit. | | 0.15 | | ns |
| Storage Time | t_{stg} | | | 0.75 | | ns |
| Fall Time | t_f | | | 0.20 | | ns |

* : The CPH5902 is classified by I_{DSS} as follows : (unit : mA)

| Rank | G | H |
|-----------|--------------|--------------|
| I_{DSS} | 10.0 to 20.0 | 16.0 to 32.0 |

The specifications shown above are for each individual FET or transistor.

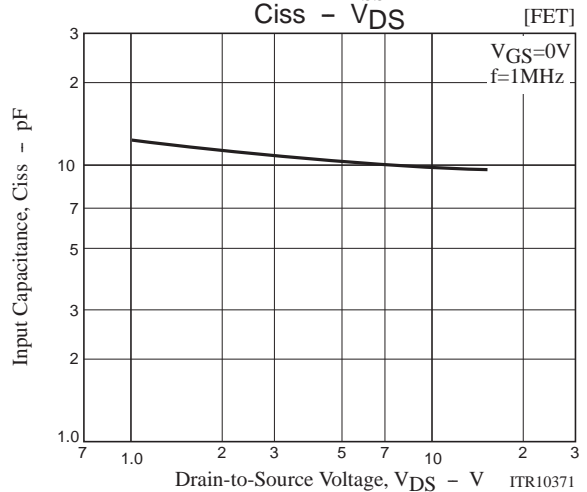
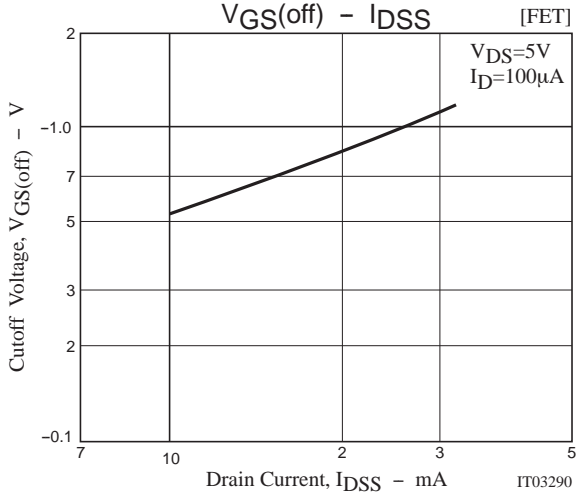
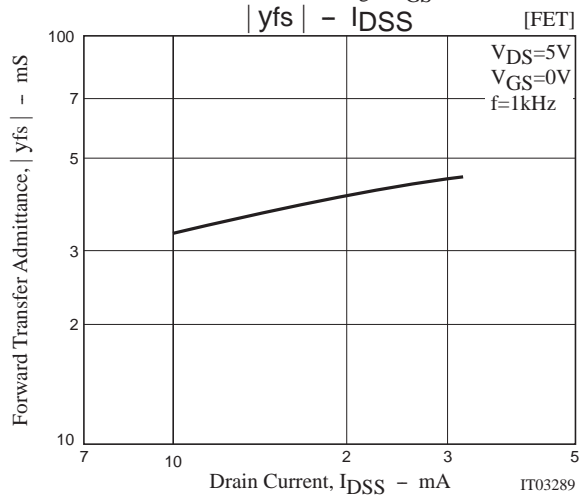
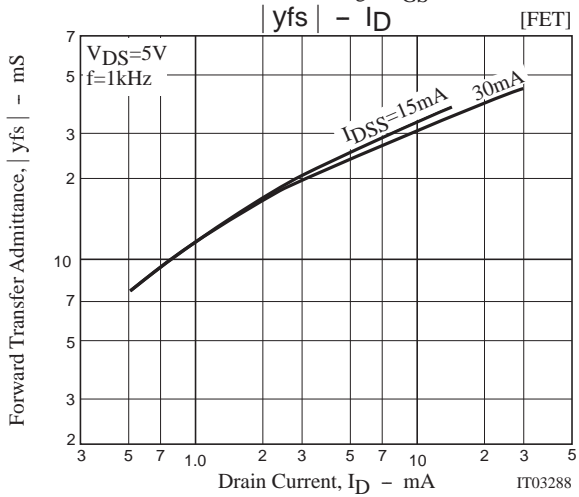
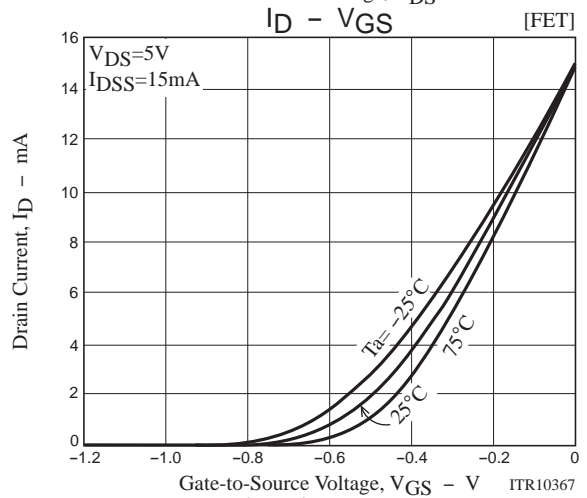
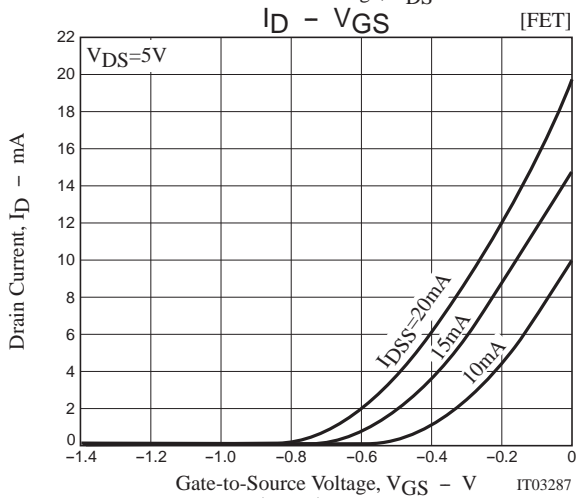
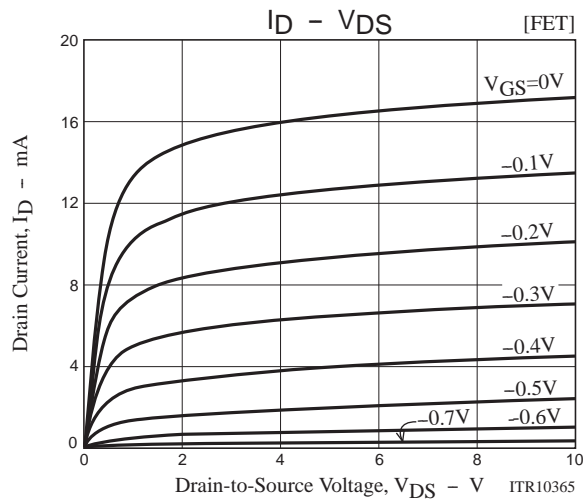
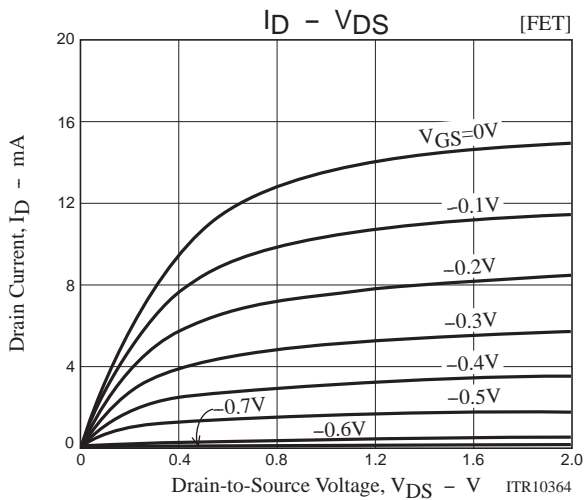
Switching Time Test Circuit

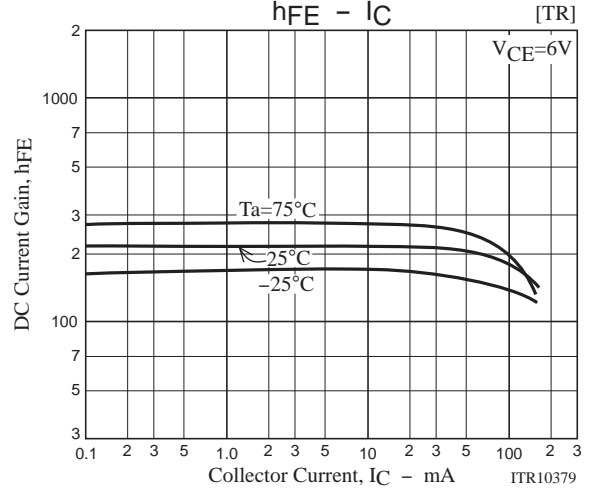
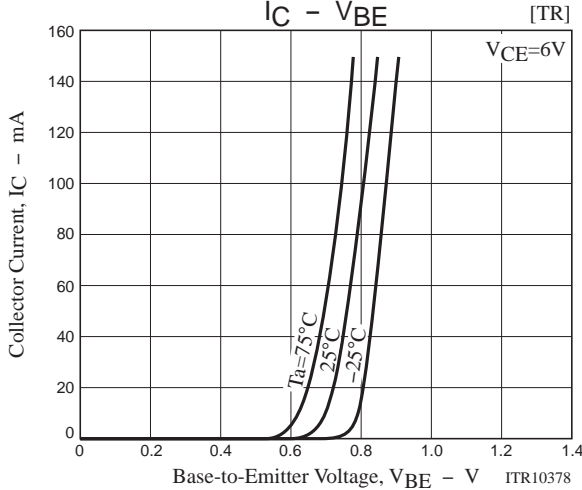
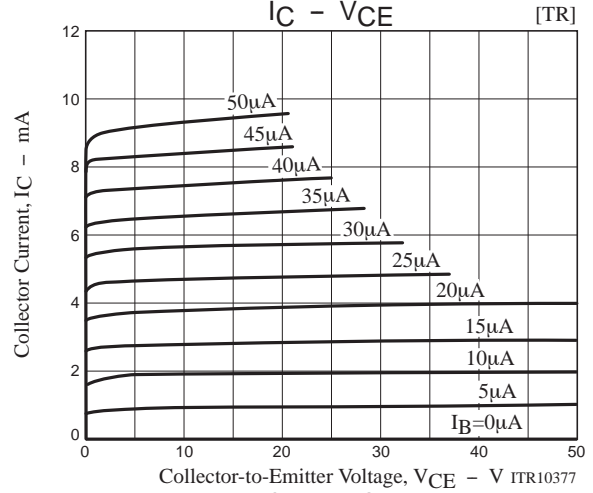
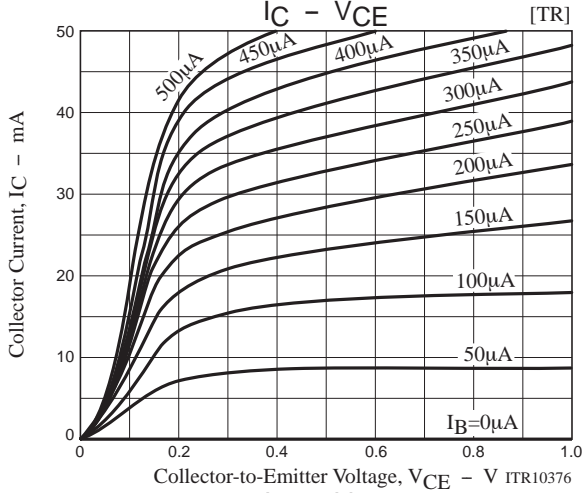
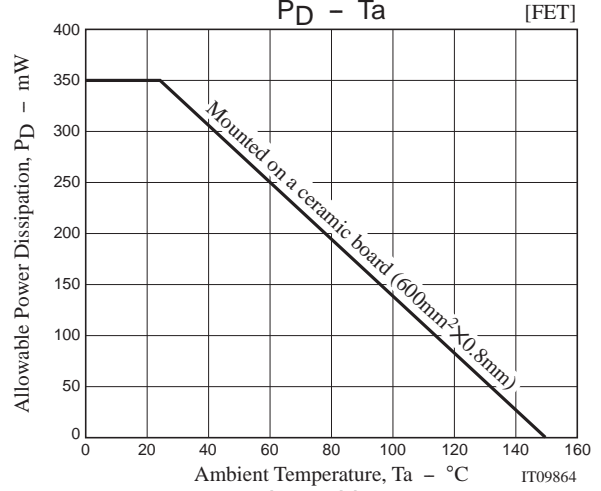
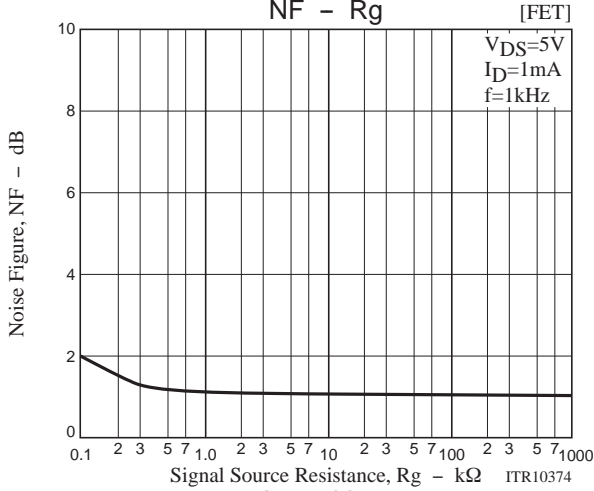
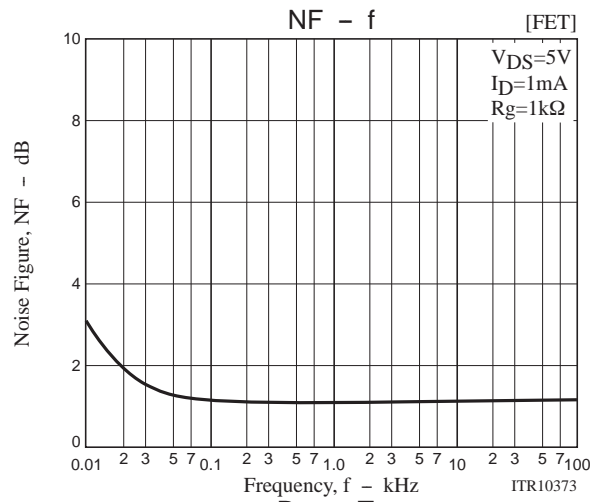
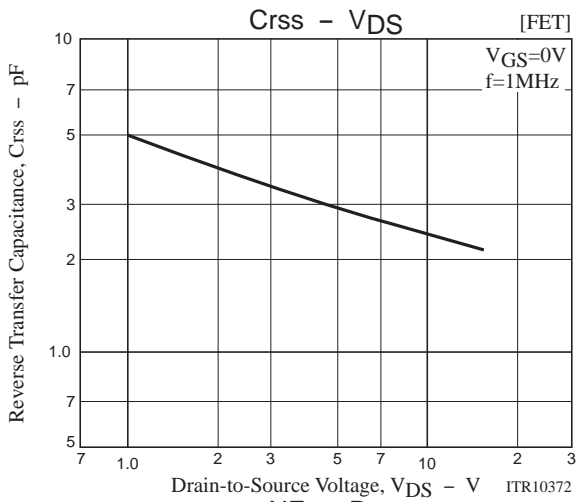


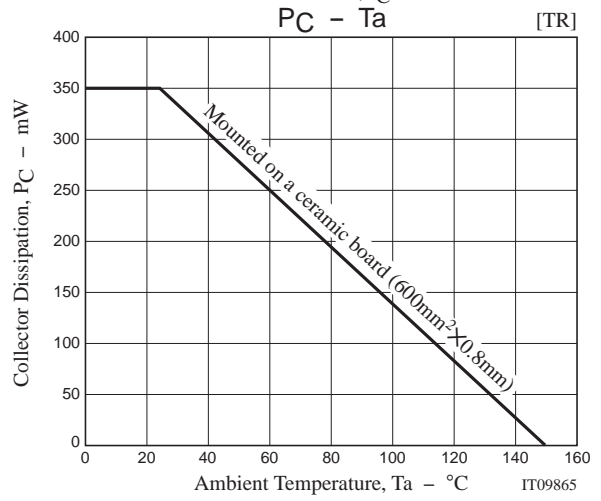
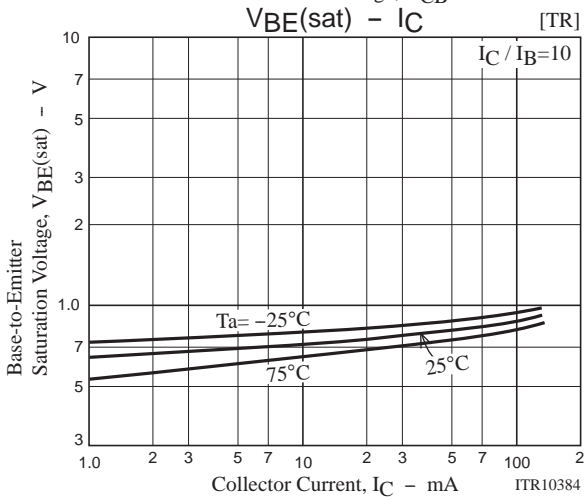
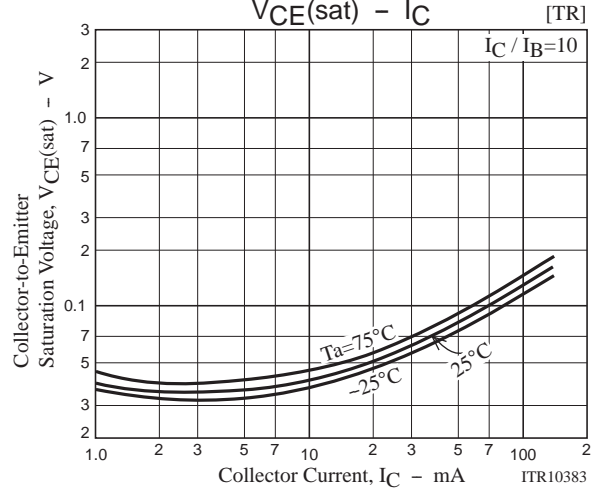
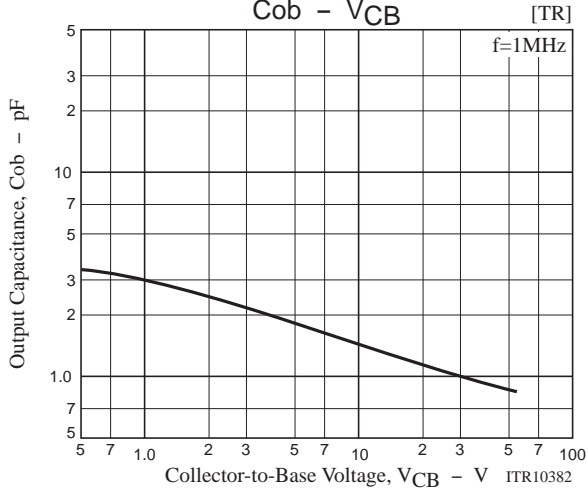
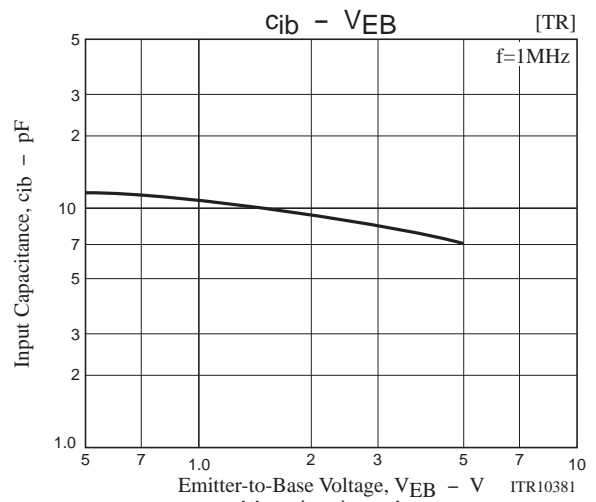
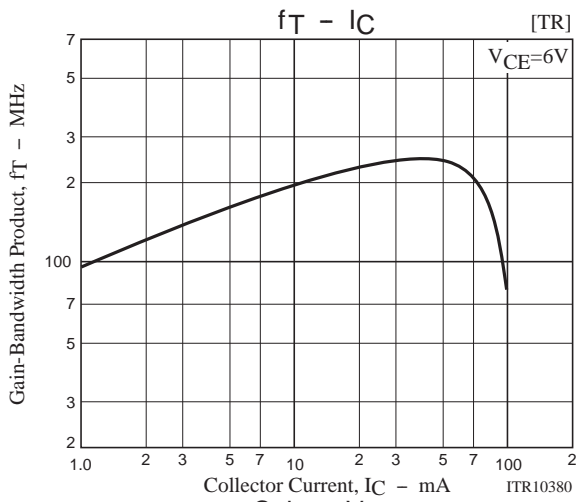
$$10I_{B1} = -10I_{B2} = I_C = 10mA$$

Ordering Information

| Device | Package | Shipping | memo |
|---------------|---------|----------------|---------|
| CPH5902G-TL-E | CPH5 | 3,000pcs./reel | Pb Free |
| CPH5902H-TL-E | CPH5 | 3,000pcs./reel | |







Embossed Taping Specification

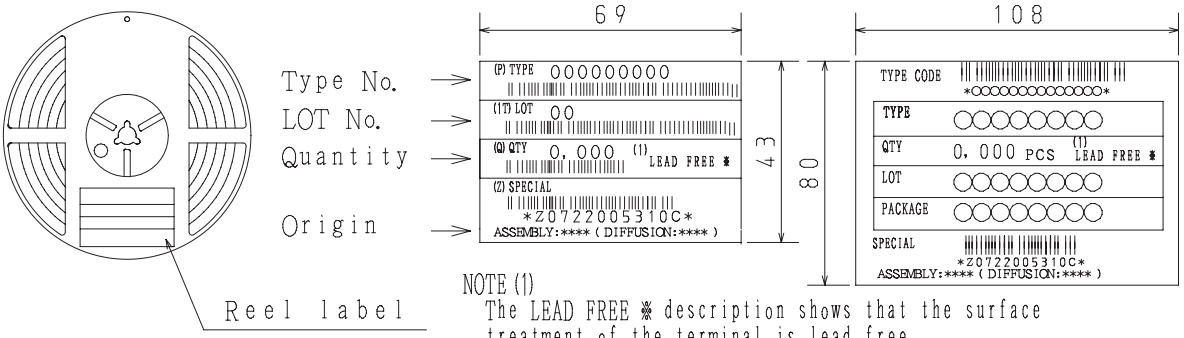
CPH5902G-TL-E, CPH5902H-TL-E

1. Packing Format

| Package Name | Carrier Tape Type | Maximum Number of devices contained (pcs) | | | Packing format | |
|--------------|-------------------|---|-----------|-----------|---|--|
| | | Reel | Inner box | Outer box | Inner BOX (C-1) | Outer BOX (A-7) |
| CPH5 | CPH6 | 3,000 | 15,000 | 90,000 | 5 reels contained Dimensions:mm (external) 183×72×185 | 6 inner boxes contained Dimensions:mm (external) 440×195×210 |

Reel label, Inner box label (unit:mm) Outer box label
 [It is a label at the time of factory shipments. The form of a label may change in physical distribution process.]

Packing method

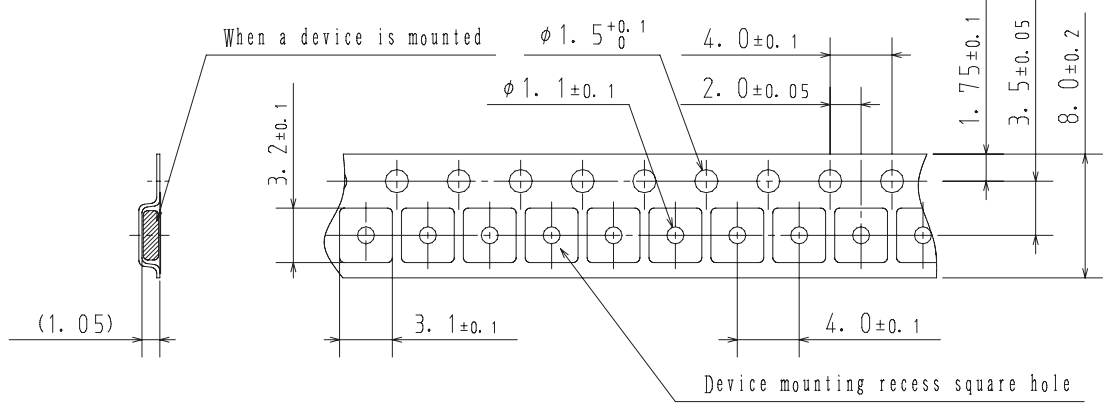


NOTE (1)
 The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

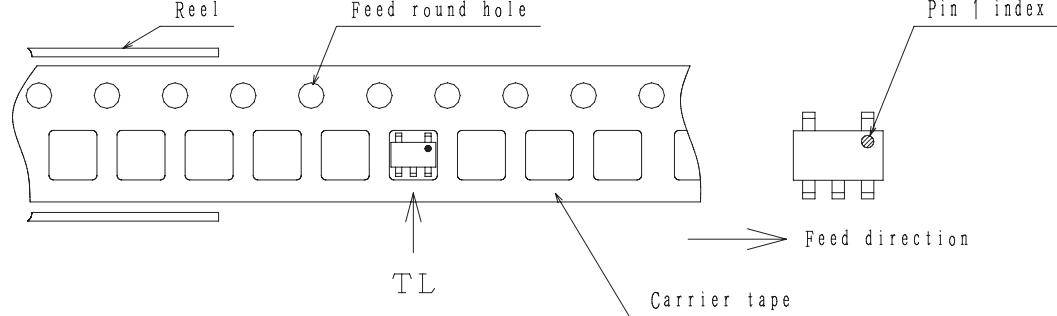
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

2. Taping configuration

2-1. Carrier tape size (unit:mm)



2-2. Device placement direction



Those with pin 1 index on the feed hole side.....TL

CPH5902

Outline Drawing

CPH5902G-TL-E, CPH5902H-TL-E



Land Pattern Example



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